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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Gail A. Alverson

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EXAMINER

TO, JENNIFER N

ART UNIT

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2195

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/663,895	Applicant(s) ALVERSON ET AL.	
	Examiner JENNIFER N. TO	Art Unit 2195	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 September 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 15-27 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 19-22 is/are allowed.
- 6) ☒ Claim(s) 1-13, 15-18, 23-25 and 27 is/are rejected.
- 7) ☒ Claim(s) 26 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>09/10/2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-13, 15-18, and 23-27 are presented for examination.
2. Claims 19-22 are allowed.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-13, 15-18, and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al. (hereafter Jones) (U.S. Patent No. 5812844), in view of Turner et al. (hereafter Turner) (U.S. Patent no. 6505229), and further in view Alverson et al. (hereafter Alverson) ("Scheduling on the Tera MTA", pages 1-28, ACM, 1995).
5. Jones and Turner were cited in the previous office action.
6. As per claim 1, Jones teaches the invention substantially as claim including a method in a computer system for scheduling tasks (abstract), the method comprising:
notifying a task that the task is being preempted from utilizing the processor (col. 11, lines 26-33; col. 12, lines 20-24; col. 19, lines 9-24);

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in response to the notification, receiving an indication from the task that it is ready to be swapped out and an indication as to whether the task is blocked (col. 12, lines 20-28; col. 20, lines 15-20);

swapping the task out (col. 20, lines 20-15);

after swapping the task out, and when it is determining that the task can be swapped back in (col. 20, lines 15-25); and

swapping the task back in (col. 20, lines 15-25).

7. Jones did not specifically teach in details that when it is determined that the task indicated that it was blocked, when it is determined that an event occurred that may cause the task to unblock, swapping the task in, when it is determined that an event did not occur that may cause the task to unblock, deferring the swapping in of the task until an event occurs that may cause the task to become unblocked, and when it is determined that the task did not indicate that it was blocked, swapping the task in.

8. However, Turner teaches in details that when task ready to be swapped back in, when it is determined that the task indicated that it was blocked, when it is determined that an event occurred that may cause the task to unblock, swapping the task in, when it is determined that an event did not occur that may cause the task to unblock, deferring the swapping in of the task until an event occurs that may cause the task to become unblocked, and when it is determined that the task did not indicate that it was blocked, swapping the task in (col. 5, lines 55-66; col. 6, lines 3-9, 20-40; col. 7, lines 20-36,

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when thread C swapping out, C in a suspend-waiting state, thread A current is executed when thread C swapped out, and when thread A finished with its time slice, thread B is executed, thread C moved to a ready queue, thus thread is ready to be swapped in but waiting for event to occur (i.e. thread B finished executed and release the resource), swapping thread C back in when it is time and the resource is available for the C).

9. It would have been obvious to one of an ordinary skill in the art at the time the invention was made to have combined the teaching of Jones and Turner because both Jones and Turner teaching of switching the task in and out based on the constrain and resource availability of the system, and in addition Turner teaching of although the task ready to be swapped back in for execution, Turner's system determining whether the task is blocked, swapping the task back in when the event occurred that unblocked the task, otherwise deferring the task swapping until an event occur to unblocked the task would improve the integrity of Jones's system by maintaining efficient use and re-reuse of system resource (Turner, col. 2, lines 45-46).

10. The combination of Jones and Turner did not specifically teach the task executing on a parallel processor architecture having multiple simultaneously executing protection domains, selecting a protection domain in which to execute the task, and executing the task in the selected protection domain.

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11. However Alverson teaches the task executing on a parallel processor architecture having multiple simultaneously executing protection domains, selecting a protection domain in which to execute the task, and executing the task in the selected protection domain (abstract; figs. 4-5; section 1. introduction; section 7.2 multi-team task processor scheduler, team assignment).

12. It would have been obvious to one of an ordinary skill in the art at the time the invention was made to have combined the teaching of Jones, Turner, and Alverson because Alverson teaching of the task executing on a parallel processor architecture having multiple simultaneously executing protection domains, and selecting/executing the task in the protection domain would improve the integrity the combined Jones and Turner's system by a system that executing different tasks simultaneously and minimizing memory overhead (Alverson, abstract).

13. As per claim 2, Turner further teaches the computer system is a multithreaded computer system (col. 3, line 66).

14. As per claim 3, Turner teaches that in response to the notification, the task save its state (col. 1, lines 40-47).

15. As per claim 4, Turner teaches that the event is an indication from an operating system (col. 6, lines 6-8).

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16. As per claim 5, Jones teaches that the indication whether the task is blocked includes an identification of a thread of the task that is blocked (col. 15, lines 2-4).

17. As per claims 6, Jones teaches that tracking a number of threads of the task that are blocked (col. 15, lines 63-67).

18. As per claims 7-13, they are rejected for the same reason as claims 1-6 above.

19. As per claim 15, Jones teaches incrementing a variable relating to the number of blocked threads (col. 16, lines 20-30). In addition, it would have been obvious to one of an ordinary skill in the art at the time the invention was made to have recognized that the task is blocked when all the threads of the task are blocked.

20. As per claim 16, Jones further teaches receiving in indication from the operating system that the thread is no longer blocked (col. 15, lines 62-67)

21. As per claim 17, Jones teaches decrementing a variable relating to a number of blocked threads (col. 16, lines 20-30).

22. As per claim 18, Alverson teaches the task does not know which of the multiple protection domains on which it is executing (section 7.2 multi-team task processor scheduler).

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23. As per claims 23-25, they are rejected for the same reason as claims 1-6 above.

In addition, Alverson teaches that multiple streams for scheduling tasks with multiple threads (). It is also obvious to one of an ordinary skill in the art at the time the invention was made to have recognized that the task being blocked when all the streams executing threads of the task are blocked.

Allowable Subject Matter

24. Claims 19-22 are allowed.

25. Claims 26-27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

26. The following is a statement of reasons for the indication of allowable subject matter:

The prior arts of recorded individually or in combination teaches the claimed invention as recited in claims 1-13, 15-18, and 23-25 above. However, the prior arts of recorded individually or in combination fail to teaches when the task swapping in, it is executing on a different protection domain than the one it was originally executing and the task being blocked as a result of all streams assigned to the task executing virtual processor code in cooperated with the recited claims.

Response to Arguments

27. Applicant's arguments with respect to 1-13, 15-23, and 23-27 have been considered but are not persuasive in view of the new ground(s) of rejection.

Conclusion

28. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

29. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JENNIFER N. TO whose telephone number is (571)272-7212. The examiner can normally be reached on M-T 6AM- 3:30 PM, F 6AM- 2:30 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Meng-Ai An/
Supervisory Patent Examiner, Art Unit 2195

/Jennifer To/
Patent Examiner
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